

**REMARKS**

Claims 1-30 are pending in the application. The Applicant has amended the independent claims (claims 1 and 16) to more clearly define what he believes to be his invention. Other claims have been amended to correct the spelling of the word “moiré.” Claim 23 has been amended to correct the dependency, claims 6 and 21 have been amended to correct the spelling of “kinegram” and claims 9 and 24 have been amended to clarify that the abbreviations “UV” and “IR” refer to “ultraviolet” and “infrared,” respectively.

The present invention is an object of value that includes a carrier layer, an optical security element disposed on the carrier layer that has a layer containing a moiré pattern and a second layer that contains a moiré analyzer. The moiré analyzer is arranged either above or below the moiré pattern and, when the moiré pattern is viewed through the moiré analyzer, a moiré image is generated. The moiré pattern and the moiré analyzer are independently formed from repeating structures. The specification discloses that:

[T]he term moire pattern is used to denote a pattern which is formed from repeating structures and which, upon superimposition with or in a condition of viewing through **a further pattern** which is formed by repeating structures and which acts as a moire analyser, shows a new pattern, namely a moire image, which is concealed in the moire pattern.

(Page 2, lines 12-16. Emphasis added.)

The specification also disclose at page 2, lines 22-24 that “it is also possible to use a moiré pattern which is constructed on two or more line grids which are rotated relative to each

other or which are in superimposed relationship.” Thus, the moiré patterns of the present invention can be line grids that are in superimposed relationship, i.e., registered relationship.

After carefully considering the Office Action mailed on September 15, 2008, the Applicant responds to the issues raised therein as follows:

***Claim Rejections – 35 USC § 102***

Claims 1-6, 8, 10, 15-21, 23, 25 and 30 have been rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent Application Publication No. 2002/0027361 to Hardwick et al. (“Hardwick”), which discloses a security device for a banknote. Hardwick discloses a substrate 10 formed from a “clear plastic material” with a security device 20 on the lower surface 11 covered by two layers of opacifying ink 13, 14. The surface 12 of the substrate 10 opposite the security device 20 also has two layers 15, 16 of opacifying ink with a half-window 18 through the two layers for viewing the security device 20. See para. [0033] and FIG. 1. Hardwick discloses that the security device can be moiré patterns (para. [0022]).

Page 2, line 24 to page 3, line 5 of the Office Action states that Hardwick teaches the use of a moiré pattern and a diffractive structure to produce a moiré image:

**the moiré pattern being introduced into the structure (see paragraph 22, lines 1-6), the surface structure also having an optical-diffraction effect containing a hologram or Kinegram (see paragraph 44, lines 1-4) which shows moiré patterns which differ from different viewing angles so that different moiré images are generated in different viewing directions (note that this is an inherent property of moiré patterns).**

(Emphasis added.)

This finding misinterprets Hardwick, which teaches that the security device 20 can be selected from a “wide variety” of devices and that this wide variety includes moiré patterns and diffractive structures. In para. [0022] Hardwick discloses the different types of security devices 20 that can be used, but Hardwick does not teach or suggest using a combination of a moiré pattern and a diffractive structure.

[0022] A **wide variety of security devices** may be employed in the present invention. Examples of the type of security devices which may be applied to the substrate in the present invention include: fine line or filigree patterns; micro-text; security stripes or threads; front and rear registration devices, including **Moiré patterns**; embossings; **diffracting gratings**; optically variable devices; coloured, fluorescent, phosphorescent and pearlescent inks and optically variable inks; metameric inks, and coloured filters which may be used to view such inks.

(Emphasis added.)

The Office Action states that paragraph [0044] of Hardwick teaches a diffractive structure that is used in combination with a moiré pattern (“the surface structure also having an optical-diffraction effect containing a hologram or Kinegram”). However, paragraph [0044] only states that in one embodiment the security device 20 can be a diffractive structure and does not teach that the diffractive structure is used in combination with a moiré pattern.

[0044] In a further embodiment of the present invention, the security device 20 applied to the first, lower surface of the substrate 10 may be an optically variable device (OVD) such as a hologram or diffraction grating. The OVD may be either fully or partially metallised.

Hardwick does not teach that the security device 20 contains an OVD (i.e., the diffractive structure) that is used in combination with a moiré pattern or any other device. Paragraphs

[0022] and [0044] of Hardwick teach that the security device can be either a moiré pattern or a diffractive structure, but there is no teaching or suggestion in Hardwick that a moiré pattern and a diffractive structure are used in combination as required by the claims of the present invention to create moiré images.

The Office Action states that Hardwick teaches a first layer containing a moiré pattern (last 3 lines of page 2 to page 3, line 1) and that a moiré analyzer is formed by a “half-window.”

Page 3, lines 5-11 of the Office Action states that:

[T]he object of value has a second layer which contains a **moiré analyzer (half-window 18)** for the moiré pattern of the first layer and which is arranged above or below the first layer in a fixed position relative to the first layer in such a way that the moiré pattern of the first layer and the moiré analyzer of the second layer are permanently optically superimposed at least in region-wise manner (see configuration in fig. 1; note the spatial relationship between security device 20 and the half-window 18).

(Emphasis added.)

The Examiner has found that the moiré analyzer in the claims is anticipated by the half-window 18 in Hardwick. The amended claims require the moiré analyzer to be “formed by repeating structures,” while the “half-window” in Hardwick is an opening in layers 15 and 16 that exposes the upper surface 12 of the substrate 10 for viewing. Hardwick discloses in para. [0034] that:

[0034] As shown in FIG. 1, the opacifying layers of ink 15 and 16 are not applied over the entire upper surface 12 of the substrate 10 and thus leave an area of the second, upper surface 12 which is **not covered** by opacifying ink to **form a “half-window” 18** on one side of the substrate substantially in the region of the security device 20 which is applied to the first, lower surface 11 of the substrate 10.

(Emphasis added.)

Hardwick clearly teaches that “the ‘half-window’ 18 [is the area] where there is no opacifying ink on the second surface 12 of the substrate 10” (para. [0038], lines 4-5), i.e., the half-window 18 is an opening in layers 15 and 16. Accordingly, there is no support in Hardwick for the finding that a moiré analyzer is formed by the half-window 18.

Moreover, there is no teaching or suggestion in Hardwick that the substrate 10 includes a repeating structure that could act as a moiré analyzer. Hardwick only teaches that the substrate 10 is a “clear plastic material.” (See para. [0035].) Thus, there is no teaching or suggestion in Hardwick that the upper surface 12 of the substrate 10, or the substrate 10 itself, contains any structures that have an optical effect and act as a moiré analyzer in the manner required by amended claims 1 and 16. Accordingly, the half-window 18 cited in the Office Action does not anticipate the moiré analyzer in the amended claims.

Hardwick only teaches a security device 20 that can include a moiré pattern (see para. [0022]). There is no teaching or suggestion of a moiré pattern used in combination with a moiré analyzer to generate a moiré image as required by the amended claims. Page 3, lines 12-17 of the Office Action cites paragraph [0023] of Hardwick (“wherein the object of value has two or more second layers which each contain a respective moiré analyzer for the moiré pattern of the first layer”) as teaching a moiré pattern being used with a moiré analyzer to generate a moiré image. However, paragraph [0023] of Hardwick only teaches a moiré pattern that is a “front to back registration device” with “different parts” as follows:

[0023] When the security device comprises a front to back registration device, such as a Moire pattern, **different parts of the device may be applied to the first and second surfaces** on both sides of the clear plastics substrate before the opacifying layers of ink are applied.

(Emphasis added.)

Paragraph [0023] of Hardwick merely discloses that the “Moire pattern” is a “front to back registration device” made up of “different parts” that can be “applied to the first and second surfaces.” This description is consistent with the specification for the present application, which teaches that a moiré pattern can be formed by a pattern of “superimposed” (i.e., registered) repeating structures. The specification of the present application discloses at page 2, lines 22-24 that:

[I]t is also possible to use a moiré pattern which is constructed on two or more line grids which are rotated relative to each other or which are in superimposed relationship.

Two or more line grids can be formed in a “superimposed relationship” by forming one line grid on the first side of a layer and the other line grid on the second side of the layer in a registered relationship. This arrangement is the type of moiré pattern disclosed by Hardwick. The Office Action has incorrectly interpreted paragraph [0023] of Hardwick as teaching the line grid on one side of the layer is a moiré pattern and the line grid on the opposing side of the layer is a moiré analyzer. Instead, Hardwick teaches that the moiré pattern is a “registration device” and that the line grids on the opposing sides of the layer form a single moiré pattern. There is no teaching or suggestion in Hardwick that one of the “different parts” of the registration device is a

moiré pattern that the other “different part” is a moiré analyzer that is used to generate a moiré image.

In contrast to Hardwick, the specification of the present application discloses at page 7, lines 1-15 that the present invention uses a moiré analyzer to view a moiré image in a moiré pattern.

A moiré pattern is a pattern which is formed from repeating structures and which upon superimposition with or in a condition of viewing through a further pattern which is formed by repeating structures and which acts as a moiré analyser, exhibits a new pattern, namely a moiré image, which is concealed in the moiré pattern. In the simplest case that moiré effect arises out of the superimposition of dark and light stripes, wherein regions in which the dark stripes of the moiré pattern and the moiré analyser are one upon the other appear lighter than regions in which the dark stripes of the moiré pattern and the moiré analyser are in mutually juxtaposed relationship. Thus it is possible for example for the moiré pattern to comprise a line grid having a multiplicity of lines at a line spacing in the range of 40 to 200  $\mu\text{m}$  and for that line grid to be phase-shifted in region-wise manner to produce the moiré image. In that respect the phase shift is preferably half a grid period. Such a moiré image can be decoded by means of a moiré analyser which has a line grid with the same line spacing.

Hardwick neither teaches nor suggests a moiré pattern that is used in combination with a moiré analyzer to generate a moiré image as required by the amended claims. Accordingly, Hardwick does not anticipate the claims and the Applicant respectfully requests that the rejections based on Hardwick be withdrawn.

***Claim Rejections – 35 USC § 1103***

Claims 7 and 22 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hardwick in view of U.S. Patent No. 4,892,336 to Kaule, et al. (“Kaule”), which discloses an

anti-falsification document having a security thread. Paragraph 4 on page 4 of the Office Action states that, “Hardwick discloses the object of value of claim 1, but fails to disclose the first layer comprising a thin film layer system which produces a color change effect” and that “Kale teaches a first layer comprising a partially shaped thin film layer system which produces a color change effect (see col. 5, lines 11-14).”

Claims 7 and 22 require the color change to be produced by “interference,” which is the addition (i.e., superposition) of two or more light waves that result in a new light wave pattern. The thin film layer systems in claims 7 and 22 produce changes in color by varying the thicknesses and densities of the layers to alter the light waves passing through the layers. In contrast, Kale discloses that: “If the stripes are, for example, individual stripes of color with different coloration, the security thread changes its color when the document is slightly tilted.” (Col. 5, lines 11-14.) Thus, the color changes in Kale result from the different colorations of the stripes and not by interference. Moreover, claims 7 and 22 depend on amended independent claims 1 and 16. As discussed above, Hardwick does not teach or suggest a moiré pattern used in combination with a moiré analyzer to generate a moiré image and Kale does not overcome this deficiency. Accordingly, claims 7 and 22 are not obvious in view of Hardwick and Kale.

Claims 9 and 24 have been rejected under 35 U.S.C. 103(a) as unpatentable over Hardwick in view of U.S. Patent Application Publication No. 2003/0003323 to Murakami et al. (“Murakami”), which discloses particles emitting fluorescence after irradiation with infrared rays. Murakami only teaches fluorescent particles and does not overcome the deficiencies in



Hardwick that are discussed above. Accordingly, claims 9 and 24 are not obvious in view of Hardwick and Murakami.

Claims 11-13 and 26-28 have been rejected under 35 U.S.C. 103(a) as unpatentable over Hardwick in view of U.S. Patent No. 5,712,731 to Drinkwater et al. ("Drinkwater"), which discloses a security device that includes an array of microimages that are viewed through a corresponding array of microlenses generates a magnified image. The Examiner has found in paragraph 6 on page 5 that Hardwick "fails to disclose a transfer layer having a partially shaped metal layer." The Examiner has cited Drinkwater as teaching these features. However, Drinkwater does not overcome the deficiencies in Hardwick that are discussed above. Accordingly, claims 11-13 and 26-28 are not obvious in view of Hardwick and Drinkwater.

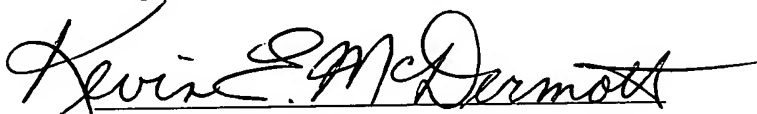
Claims 14 and 29 have been rejected under 35 U.S.C. 103(a) as unpatentable over Hardwick in view of U.S. Patent Application Publication No. 2003/0137145 to Fell et al. ("Fell"), which discloses an article having a security device and a verification means, wherein the verification means is brought into register with the security device to authenticate the article. The Examiner has found that Hardwick "fails to disclose a loose moiré analyzer" (page 6, lines 9-10). Fell has been cited as teaching "a loose moiré analyzer." However, Fell does not overcome the deficiencies in Hardwick that are discussed above. Accordingly, claims 14 and 29 are not obvious in view of Hardwick and Fell.

***Conclusion***

The Applicant submits that the amendments to the claims and the arguments made herein clearly distinguish the claims from the cited prior art references. Moreover, the cited prior art references (either alone or in combination) do not teach or suggest the use of a moiré pattern in combination with a moiré analyzer to generate a moiré image as required by the claims of the present invention. Accordingly, the Applicant respectfully requests that the rejections of the claims be withdrawn and the claims be allowed.

If the Examiner has any questions relating to this Amendment, the Examiner is respectfully invited to contact Applicant's attorney at the telephone number provided below.

Respectfully submitted,

A handwritten signature in black ink, reading "Kevin E. McDermott". The signature is fluid and cursive, with a horizontal line drawn underneath the name.

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